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(54) **METHOD FOR USING VIRTUAL FACIAL EXPRESSIONS**

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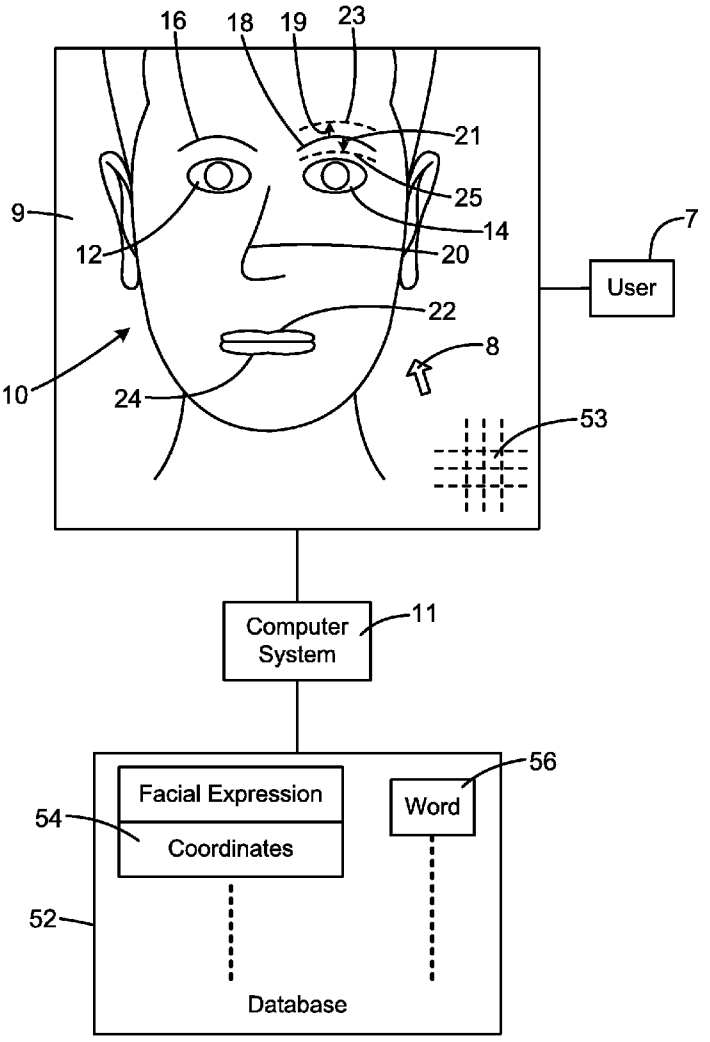
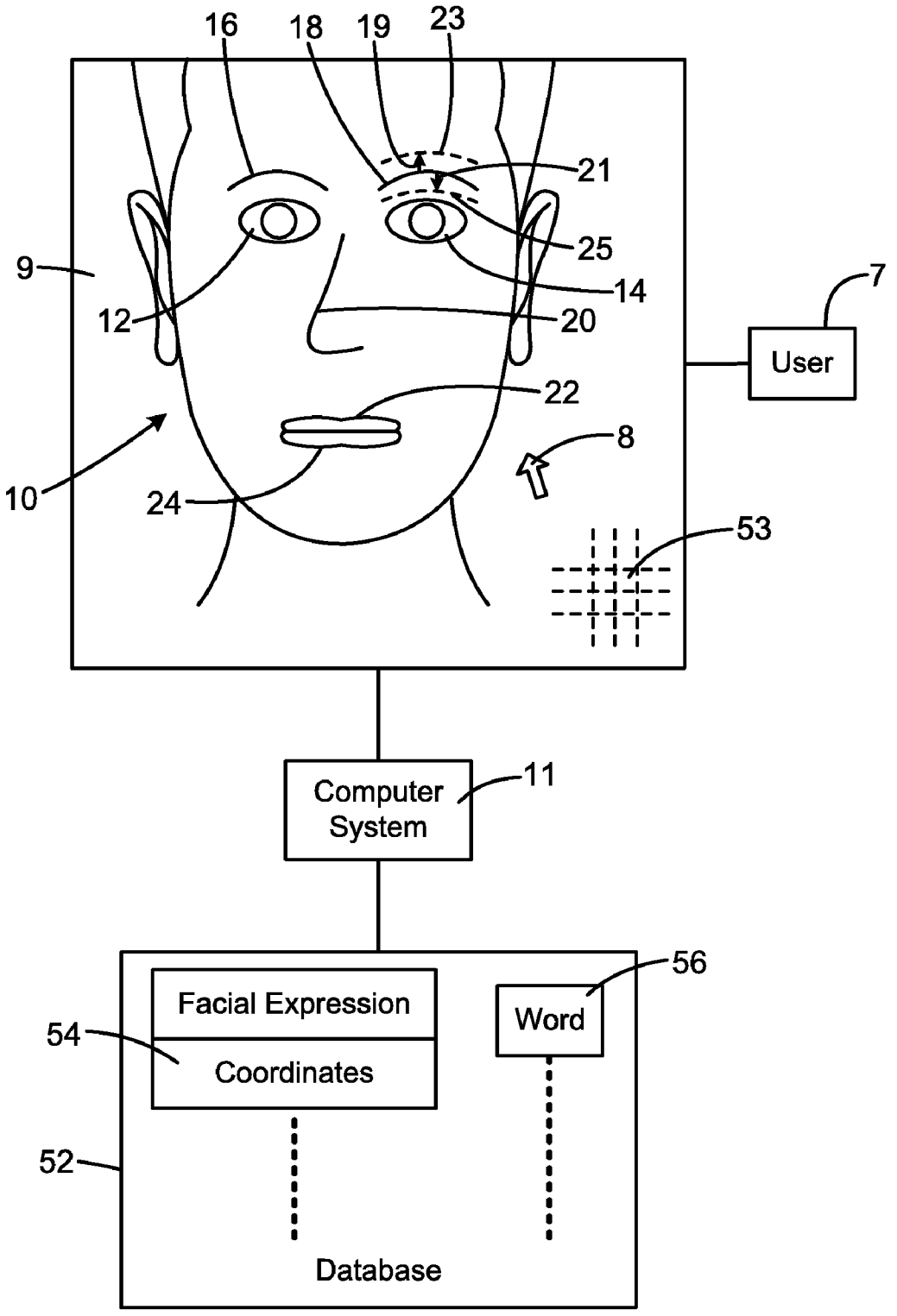
(57) **ABSTRACT**

The method is for using a virtual face. The virtual face is provided on a screen associated with a computer system having a cursor. A user manipulates the virtual face with the cursor to show a facial expression. The computer system determines coordinates of the facial expression. The computer system searches for facial expression coordinates in a database to match the coordinates. A word or phrase is identified that is associated with the identified facial expression coordinates. The screen displays the word to the user. The user may also feed a word to the computer system that displays the facial expression associated with the word.




16
18
19
23
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9
14
12
20
7
User
22
8
10
24
53
Computer System
11
56
Facial Expression
Word
54
Coordinates
52
Database

FIG. 1

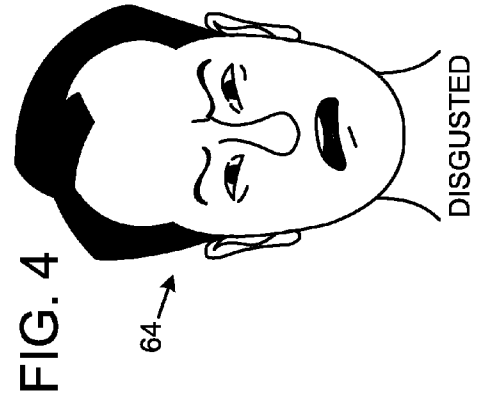


FIG. 4

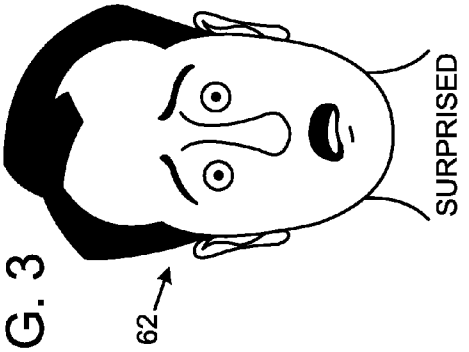


FIG. 3

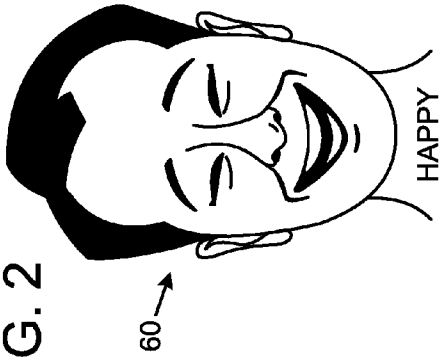


FIG. 2

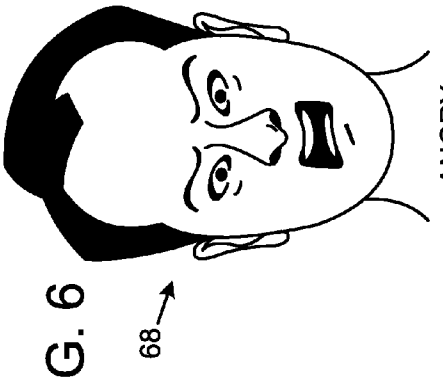


FIG. 6

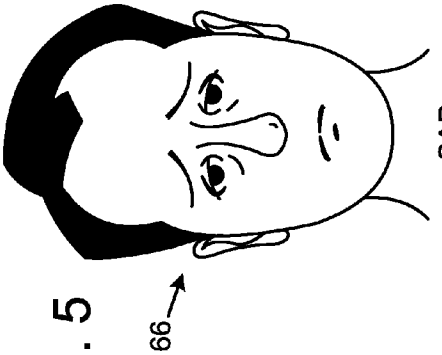
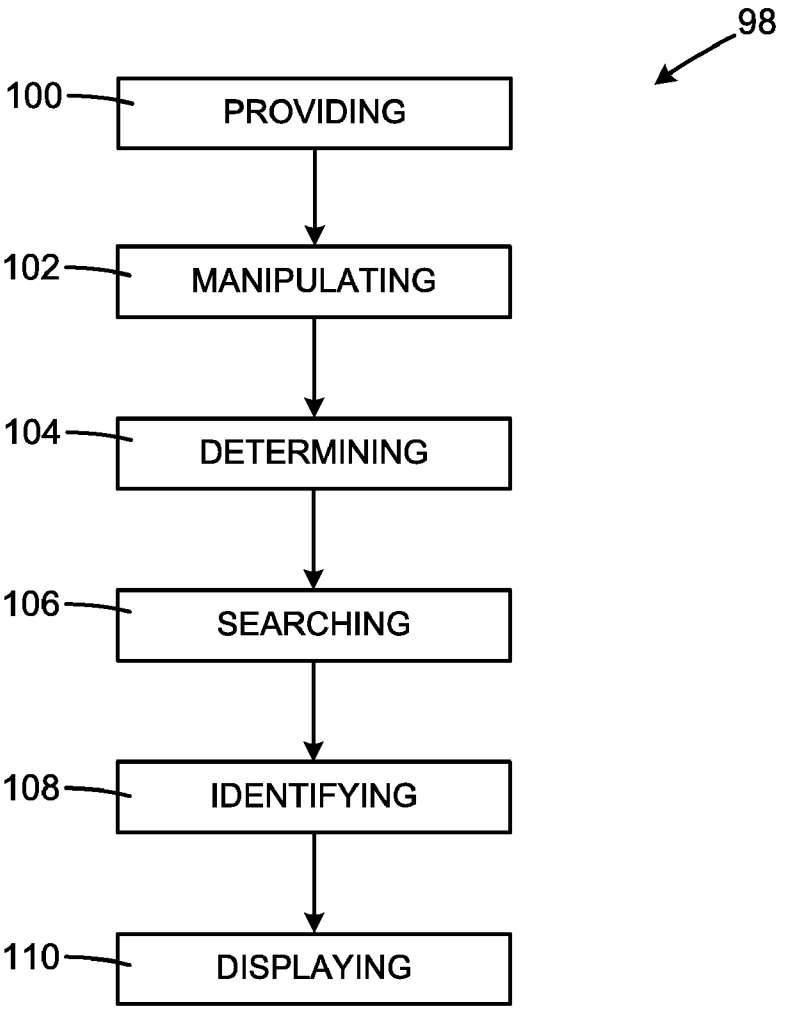


FIG. 5

FIG. 7


98
100
PROVIDING
102
MANIPULATING
104
DETERMINING
106
SEARCHING
108
IDENTIFYING
110
DISPLAYING

METHOD FOR USING VIRTUAL FACIAL EXPRESSIONS

TECHNICAL FIELD

[0001] The invention relates to a method for using virtual facial expressions.

BACKGROUND OF INVENTION

[0002] Facial expressions and other body movements are vital components of human communication. Facial expressions may be used to express feelings such as surprise, anger, sadness, happiness, fear, disgust and other such feelings. For some there is a need to train to better understand and interpret those expressions. For example, sales man, police and others may benefit from being able to better read and understand facial expressions. There is currently no effective method or tool available to train or study the perceptiveness of facial and body expressions. Also, in psychological and medical research, there is a need to measure subjects' psychological and physiological reactions to particular, predetermined bodily expressions of emotions. Conversely, there is a need to provide subjects with a device for creating particular, named emotional expressions in an external medium.

SUMMARY OF INVENTION

[0003] The method of the present invention provides a solution to the above-outlined problems. More particularly, the method is for using a virtual face. The virtual face is provided on a screen associated with a computer system that has a cursor. A user may manipulate the virtual face with the cursor to show a facial expression. The computer system may determine coordinates of the facial expression. The computer system searches for facial expression coordinates in a database to match the coordinates. A word or phrase is identified that is associated with the identified facial expression coordinates. The screen displays the word to the user. It is also possible for the user to feed the computer system with a word or phrase and the computer system will search the database for the word and its associated facial expression. The computer system may then send a signal to the screen to display the facial expression associated with the word.

BRIEF DESCRIPTION OF DRAWINGS

[0004] FIG. **1** is a schematic view of the system of the present invention;

[0005] FIG. **2** is a front view of a virtual facial expression showing a happy facial expression of the present invention;

[0006] FIG. **3** is a front view of a virtual facial expression showing a surprised facial expression of the present invention;

[0007] FIG. **4** is a front view of a virtual facial expression showing a disgusted facial expression of the present invention;

[0008] FIG. **5** is a front view of a virtual face showing a sad facial expression of the present invention;

[0009] FIG. **6** is a front view of a virtual face showing an angry facial expression of the present invention; and

[0010] FIG. **7** is a schematic information flow of the present invention.

DETAILED DESCRIPTION

[0011] With reference to FIG. **1**, the digital or virtual face **10** may be displayed on a screen **9** that is associated with a computer system **11** that has a movable mouse cursor **8** that may be moved by a user **7** via the computer system **11**. The face **10** may have components such as two eyes **12**, **14**, eye brows **16**, **18**, a nose **20** an upper lip **22** and a lower lip **24**. The virtual face **10** is used as an exemplary illustration to show the principles of the present invention. The same principles may also be applied to other movable body parts. A user may manipulate the facial expression of the face **10** by changing or moving the components to create a facial expression. For example, the user **7** may use the computer system **11** and point the cursor **8** on the eye brow **18** and drag it upwardly or downwardly, as indicated by the arrows **19** or **21** so that the eye brow **18** moves to a new position further away from or closer to the eye **14** as illustrated by eye brow position **23** or eye brow position **25**, respectively. The virtual face **10** may be set up so that the eyes **12**, **14** and other components of the face **10** also simultaneously change as the eye brows **16** and **18** are moved. Similarly, the user may use the cursor **8** to move the outer ends or inner segments of the upper and lower lips **22**, **24** upwardly or downwardly. The user may also, for example, separate the upper lip **22** from the lower lip **24** so that the mouth is opened in order to change the overall facial expression of the face **10**.

[0012] The coordinates for each facial expression **54** may be associated with a word or words **56** stored in the database **52** that describe the feeling illustrated by facial expressions such as happy, surprised, disgusted, sad, angry or any other facial expression. FIG. **2** shows an example of a happy facial expression **60** that may be created by moving the components of the virtual face **10**. FIG. **3** shows an example of a surprised facial expression **62**. FIG. **4** shows a disgusted facial expression **64**. FIG. **5** shows a sad facial expression **66** and

[0013] FIG. **5** shows an example of an angry facial expression **68**.

[0014] When the user **7** is complete with the manipulating, moving or changing of the components, such as the eye brows, the computer system **11** reads the coordinates **53** (i.e. the exact position of the components on the screen **9**) of the various components of the face and determines what the facial expression is. The coordinates for each component may thus be combined to form the overall facial expression. It is possible that each combination of the coordinates of the facial expressions **54** of the components may have been pre-recorded in the database **52** and associated with a word or phrase **56**. The face **10** may also be used to determine the required intensity of the facial expression before the user will see or be able to identify a certain feeling, such as happiness, expressed by the facial expression. The user's time of exposure may also be varied and the number or types of facial components that are necessary until the user can identify the feeling expressed by the virtual face **10**. As indicated above, the computer system **11** may recognize words communicated to the system **11** by the user **7**. By communicating a word **56** to the system **11**, the system preferably searches the database **52** for the word and locates the associated facial expression coordinates **54** in the database **52**. The communication of the word **56** to the system **11** may be orally, visually, by text or any other suitable means of communication. In other words,

the database **52** may include a substantial number of words and each word has a facial expression associated therewith that have been pre-recorded as pamphlets based on the positions of the coordinates of the movable components of the virtual face **10**. Once the system **11** has found the word in the database **52** and its associated facial expression, the system sends signals to the screen **9** to modify or move the various components of the face **10** to display the facial expression associated with the word. If the word **56** is "happy" and this word has been pre-recorded in the database **52** then the system will send the coordinates to the virtual face **10** so that the facial expression associated with "happy" will be shown such as the happy facial expression shown in FIG. **2**. In this way, the user may interact with the virtual face **10** of the computer system **11** and contribute to the development of the various facial expressions by pre-recording more facial expressions and words associated therewith.

[0015] It is also possible to reverse the information flow in that the user may create a facial expression and the system **11** will search the database **52** for the word **56** associated with the facial expression that was created by the user **7**. In this way, the system **11** may display a word once the user has completed the movements of the components of the face **10** to create the desired facial expression. The user may thus learn what words are associated with certain facial expressions.

[0016] It may also be possible to read and study the eye movements of the user as the user sees different facial expressions by, for example, using a web camera. The user's reaction to the facial expressions may be measured, for example the time required to identify a particular emotional reaction. The facial expressions may also be displayed dynamically overtime so illustrate how the virtual face gradually changes from one facial expression to a different facial expression. This may be used to determine when a user perceives the facial expression changing from, for example, expressing a happy feeling to a sad feeling. The coordinates for each facial expression may then be recorded in the database to include even those expressions that are somewhere between happy expressions and sad expressions. It may also be possible to just change the coordinates of one component to determine which components are the most important when the user determines the feeling expressed by the facial expression. The nuances of the facial expression may thus be determined by using the virtual face **10** of the present invention. In other words, the coordinates of all the components, such as eye brows, mouth etc., cooperate with one another to together form the overall facial expression. More complicated or mixed facial expressions, such as a face with sad eyes but a smiling mouth, may be displayed to the user to train the user to recognize or identify mixed facial expressions.

[0017] By using the digital facial expression of the present invention, it may be possible to enhance digital messages such as SMS or email with facial expressions based on words in the message. It may even be possible for the user himself/herself to include a facial expression of the user to enhance the message. The user may thus use a digital image of the user's own face and modify this face to express a feeling with a facial expression that accompanies the message. For example the method may include the step of adding a facial expression to an electronic message so that the facial expression identifies a word describing a feeling in the electronic message and displaying the feeling with the virtual face.

[0018] Cultural differences may be studied by using the virtual face of the present invention. For example, a Chinese person may interpret the facial expression different from a Brazilian person. The user may also use the user's own facial expression and compare it to a facial expression of the virtual face **10** and then modify the user's own facial expression to express the same feeling as the feeling expressed by the virtual face **10**.

[0019] FIG. **7** illustrates an example **98** of using the virtual face **10** of the present invention. In a providing step **100**, the virtual face **10** on the screen **9** associated with the computer system **11**. In a manipulating step **102**, the user **7** manipulates the virtual face **10** by moving components thereon such as eye brows, eyes, nose and mouth, with the cursor **8** to show a facial expression such as a happy or sad facial expression. In a determining step **104**, the computer system **11** determines the coordinates **53** of the facial expression created by the user. In a searching step **106**, the computer system **11** searches for facial-expression coordinates **54** in a database **52** to match the coordinates **53**. In an identifying step **108**, the computer system **11** identifies a word **56** associated with the identified facial expression coordinates **54**. The invention is not limited to find just identifying a word but other expressions such as phrases are also included. In a displaying step **110**, the computer system **11** displays the identified word **56** to the user **7**.

[0020] While the present invention has been described in accordance with preferred compositions and embodiments, it is to be understood that certain substitutions and alterations may be made thereto without departing from the spirit and scope of the following claims.

1. A method for using a virtual face, comprising:
providing a virtual face on a computer screen associated with a computer system having a cursor;
manipulating the virtual face with the cursor to show a facial expression;
the computer system determining coordinates of the facial expression;
the computer searching for facial expression coordinates in a database to match the coordinates;
identifying a word associated with the identified facial expression coordinates; and
displaying the word to the user.

2. The method according to claim **1** wherein the method further comprises the steps of pre-recording words describing facial expression in the database.

3. The method according to claim **2** wherein the method further comprises the steps of pamphlets of facial expression coordinates of facial expressions in the database and associating each facial expression with the pre-recorded words.

4. The method according to claim **1** wherein the method further comprises the steps of feeding the word to the computer system, the computer system identifying the word in the database associating the word with a facial expression associated with the word in the database.

5. The method according to claim **4** wherein the method further comprises the steps of the screen displaying the facial expression associated with the word.

6. The method according to claim **1** wherein the method further comprises the steps of training a user to identify facial expression.

7. The method according to claim **1** wherein the method further comprises the steps of adding a facial expression to an electronic message so that the facial expression identifies a word describing a feeling in the electronic message and displaying the feeling with the virtual face.

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